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An Extensive Recess in the Cavotricuspid Isthmus Identified by Transthoracic Three-Dimensional Echocardiography in Atrial Flutter Ablation

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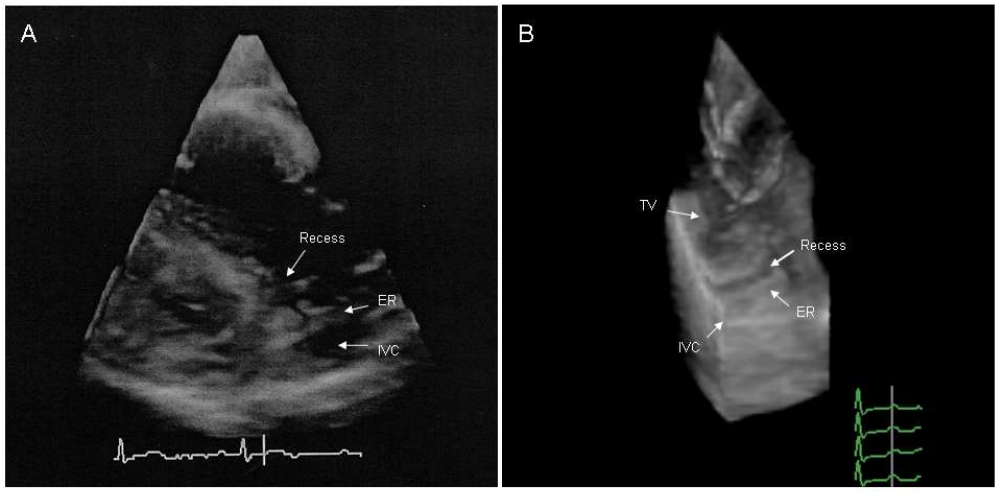
A 70-year-old man presented with sustained atrial flutter and dizziness. Surface 12-lead electrocardiogram showed the typical characteristics of atrial flutter. The day before ablation, transthoracic two-dimensional (2D) and real-time three-dimensional (3D) echocardiography (IE33; Philips Ultrasound, Bothell, Washington) were performed. The 2D echocardiogram showed a recess in the cavotricuspid isthmus. However, extension of the recess could not be fully evaluated because of its complex structure and limitations of the 2D imaging. Real-time 3D imaging was able to reveal a deep recess on the modified apical long-axis view. By rotating the probe, we found that the recess was long and extended along the entire isthmus (Fig.); this finding was not depicted on the 2D imaging. Electrophysiologic study demonstrated atrial flutter with a counterclockwise propagation through the cavotricuspid isthmus. A 7 Fr quadripolar deflectable catheter (Biosense-Webster) with an 8-mm tip was used for linear ablation of the isthmus. We attempted linear radiofrequency ablation by using the dragging technique from the tricuspid annulus to the border of the inferior vena cava. Even after repeated attempts with multiple linear ablations, bidirectional conduction block at the isthmus could not be achieved. Transthoracic 3D echocardiography is useful to detect the isthmus abnormality resistant to ablation therapy before ablation procedure. The presence of a large and extended isthmus recess may prevent a complete isthmus block and was assumed the major cause of the unsuccessful isthmus ablation. When such a recess is found before the ablation procedure, a more aggressive ablation strategy should be considered.

Figure Legends

Figure. (A) Modified apical long-axis view of three-dimensional echocardiogram demonstrates a recess (arrow) with an uneven surface in the cavotricuspid isthmus. (B) A rotated modified apical long-axis view of transthoracic three-dimensional echocardiogram to obtain the best view of the cavotricuspid isthmus and recess. A large and extended recess along the isthmus was demonstrated. ER = Eustachian ridge, IVC = inferior vena cava, TV = tricuspid valve.



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